

December 17, 1997

Mr. Richard D. Wilson
Acting Assistant Administrator
Office of Air and Radiation (6101)
Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

Dear Mr. Wilson:

Enclosed are several recommendations developed by the Industrial Combustion Coordinated Rulemaking (ICCR) Federal Advisory Committee (a.k.a. ICCR Coordinating Committee). The Committee is submitting these recommendations to the Environmental Protection Agency (EPA) for EPA's consideration in the development of regulations under Sections 112 and 129 of the Clean Air Act.

The ICCR Coordinating Committee was established by the EPA under the Federal Advisory Committee Act (FACA) in September, 1996. The purpose of the Committee is to develop recommendations for consideration by EPA in the development of regulations for the following stationary combustion source categories: combustion turbines; internal combustion engines; industrial-commercial-institutional boilers; process heaters; and non-hazardous waste incinerators (excluding municipal waste combustors and medical waste incinerators). Sections 112 and 129 direct the EPA to develop regulations limiting emissions of hazardous air pollutants (and several criteria air pollutants) from these source categories by November, 2000.

To assist in efforts to develop recommendations for EPA, the ICCR Coordinating Committee has established seven Work Groups - one work group for each of the five source categories listed above, one for economic analysis, and one for emission testing and emission monitoring. In addition, where the Coordinating Committee considers it warranted, subgroups are established to examine an issue and develop recommendations for consideration by the Committee.

The Coordinating Committee met six times in fiscal year 1997. Notice of all meetings of the Committee was published in advance in the Federal Register and all meetings were open to the public. In March, 1997, the Coordinating Committee provided recommendations to EPA concerning information collection and an Information Collection Request (ICR), which was subsequently undertaken by EPA.

In November, 1997, the Coordinating Committee met to discuss recommendations for consideration by EPA in three areas. The first area was a definition of the term "solid waste" for the purpose of regulations developed under Section 129 of the Act (Section 129 directs EPA to develop regulations for solid waste incinerators). The second area was a list of hazardous air pollutants to test for in any additional emission testing the EPA might undertake for internal combustion engines, as well as recommendations for additional emission testing by EPA for internal combustion engines. The third area was a list of hazardous air pollutants to test for in any additional emission testing the EPA might undertake for combustion turbines.

At the November meeting, the Coordinating Committee reached closure on recommendations in each of these areas. These recommendations are submitted as three enclosures. Enclosure I contains the Committee's recommendations on the definition of the term solid waste for the purpose of regulations developed under Section 129 of the Act. Enclosure II contains the Committee's recommendations on a list of pollutants to test for in any additional emission testing for internal combustion engines, as well as additional emission testing for internal combustion engines. Enclosure III contains the Committee's recommendations on a list of pollutants to test for in any additional emission testing for combustion turbines.

Although the Coordinating Committee reached closure on recommendations in these areas, it did not reach consensus on these recommendations. As a result, each enclosure consists of three items. The first item within each enclosure consists of a presentation made to the Committee by a work group or subgroup charged with responsibility for developing recommendations for consideration by the Committee. The second and third items, which are attached to the first item, outline various majority/minority stakeholder views or concerns. Together, all three items within the enclosure constitute the Committee's recommendations to EPA.

As the ICCR Coordinating Committee Co-Chairs, we were charged by the Committee at the November meeting with drafting this transmittal letter to formally submit the Committee's recommendations to EPA. In addition, the ICCR Coordinating Committee directed us to request review of these recommendations by the EPA as quickly as possible and to request feedback from EPA on these recommendations at the next meeting of the Committee on February 24-25, 1998.

Timely feedback is essential to the Committee's ability to develop further recommendations for consideration by EPA. This is particularly true regarding a definition of the term solid waste for the purpose of regulations developed under Section 129 of the Act. The definition of this term determines which sources would be regulated under Section 112 of the Act and which sources would be regulated under Section 129 of the Act. Thus, to proceed with developing further recommendations for consideration by EPA, the Committee needs a "working" definition of this term, at the very least.

Sincerely,

[Signed By]
Richard F. Anderson, Ph.D.
Stakeholder Co-Chair
ICCR Coordinating Committee

[Signed By]
Fred L. Porter
EPA Co-Chair
ICCR Coordinating Committee

cc: Bruce C. Jordan - Director, Emission Standards Division
John S. Seitz - Director, Office of Air Quality Planning and Standards

ENCLOSURE I

ITEM 1

November 14, 1997

SOLID WASTE DEFINITION SUBGROUP MATERIALS FOR NOVEMBER COORDINATING COMMITTEE MEETING

BACKGROUND

Note: This background was written by Jan Connery, facilitator for the Solid Waste Definition Subgroup. At the end of the subgroup's final meeting, the members asked her to prepare a brief statement to provide a historical context for the subgroup's report. This statement was not reviewed by subgroup members prior to posting on the TTN. Minor revisions were made following a teleconference of Jan Connery, Dick Van Frank, Jeff Shumaker, Frank Ferraro, Fred Porter, and Ruth Mead.

The Solid Waste Definition Subgroup was formed by the ICCR Coordinating Committee in July 1997. The Coordinating Committee charged the subgroup with developing, for the Coordinating Committee's consideration, recommendations for a definition of the term nonhazardous "solid waste" to be used in regulations developed under Section 129 of the Clean Air Act.

The Subgroup consisted of 11 members with the following stakeholder composition: EPA (1), environmental (2), state/local agencies (1), burners (3), generators (1), small business (1), industry at large (2). Five members were from the boilers work group, three from incinerators, two from process heaters, and one from gas turbines. The group met four times. The Coordinating charged the subgroup with completing its mission by the November 1997 Coordinating Committee meeting.

As instructed by the Coordinating Committee, the Subgroup began by considering the statutory definition of the term "solid waste" found in the Solid Waste Disposal Act (as amended by RCRA) and the regulatory definition of the term "solid waste" found in 40 CFR 261.2. After lengthy discussions about possible approaches to defining solid waste, the group reached consensus on an approach that would define solid waste as discarded materials which are burned, except for fuels burned for energy recovery or materials burned for chemical recovery. The subgroup then focussed on defining fuels and materials burned for chemical recovery. The subgroup agreed that the definition of fuels would include a list of fuels. Absent acceptable criteria, consensus could not be reached on whether the definition of fuels should also include criteria against which materials not listed could be tested to determine if they were fuels. The subgroup also agreed that the definition of chemicals burned for chemical recovery would consist of a list of materials.

At the fourth and final meeting of the subgroup, six members put forward a "strawman" document. This document built on earlier subgroup decisions, as well as new ideas from the six members, to propose language for a full definition, a list of fuels, criteria for determining

whether a material was a fuel, a list of materials burned for chemical recovery, and a rationale for the approach. Other subgroup members also proposed additions to the fuel list.

Using these materials and suggestions put forth at the meeting, the subgroup reached consensus on the opening language of the definition, the list of fuels, and materials burned for chemical recovery. The subgroup also agreed to list a series of alternative proposals for criteria that could be used to determine whether a material is a fuel. These products constitute the subgroup's report to the Coordinating Committee. Areas of nonconsensus are included in this report either as "consensus concerns" that describe the area of concern for which consensus was not reached, or as a list of alternatives proposed by various members or groups of members.

With regard to the rationale included in the strawman document, the subgroup could not reach consensus by the end of the final meeting. The strawman rationale (as amended by comments from subgroup members) is included in this TTN posting. Members who disagreed with the strawman rationale were invited to provide an alternative rationale by November 7, 1997, for inclusion in the TTN posting.

RECOMMENDATIONS FROM SOLID WASTE DEFINITION SUBGROUP

Solid Waste Definition Under Section 129

For the purpose of regulation under section 129, solid waste is sludge, garbage, refuse, and other discarded material including solid, liquid, semisolid, or contained gaseous material, which is burned. Materials, as listed below, burned for the primary purpose of recovering their chemical constituents are not solid waste. Fuels, as defined below, burned to recover energy are not solid waste.

Consensus concern: Agency to take comment on analogous processes to consider under the primary purpose and recovery criteria (i.e., Table C).

Table A includes those materials specifically listed as fuels, and Table B contains the criteria for characterizing a fuel if the material is burned for energy recovery and is not already listed in Table A. Materials listed in Table A or meeting the criteria in Table B are fuels and are, therefore, not a solid waste. Table C contains a list of materials burned primarily to recover its chemical constituents and is, therefore, not a solid waste.

Table A

The following materials are fuels (in alphabetical order):

Bagasse, meaning the solid material (principally cellulose fiber and pith from sugarcane) which is produced at sugarcane mills during the processing of the cane to produce sugar.

Biomass is any vegetative matter that recently was alive, including agricultural and silvicultural materials, such as logging residues (slash), nut and grain hulls and chaff (e.g., almond, walnut, peanut, rice, wheat), orchard prunings, corn stalks, grass clippings, leaves, coffee bean hulls and grounds, etc. This definition does not include sewage sludge, fermentation tank bottoms.

Fossil fuels are coal, oil, and natural gas, as defined below:

Coal means all solid fuels classified as anthracite, bituminous, subbituminous, or lignite by the American Society of Testing and Materials in ASTM D388-77, Standard Specification for Classification of Coals by Rank (IBR-see section 60.17), coal refuse, and petroleum coke. Coal-derived synthetic fuels, including but not limited to solvent-refined coal, gasified coal, coal-oil mixtures, and coal-water mixtures, are also included in this definition for the purposes of this subject.

Natural gas means (1) a naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in geologic formations beneath the earth's surface, of which the principal constituent is methane; or (2) liquid petroleum gas, as defined by the American Society of

Testing and Materials in ASTM D1835-82, Standard Specification for Liquid Petroleum gases (IBR-see section 60.17).

Oil means crude oil or petroleum or a liquid or gaseous fuel derived from crude oil or petroleum, including distillate oil (Nos. 1-4) and residual oil (Nos. 5 and 6).

Hydrogen

Wood Materials containing only natural levels of halogens, except railroad ties and pressure-treated wood.

Consensus concern: Keep the door open for evolving technology, *e.g.*, process-engineered fuels.

Consensus concern: Mixing in other materials with any fuel.

Consensus concern: Some feel that fuels exempt from the definition of solid waste in part 261 should be added to the list. Others feel that not all of these materials should be considered fuels.

Consensus concern: Pulp knots, broke, pulp rejects, paper rejects, clarifier sludge, and other nonrecyclable fiber were identified as potential fuels that need to be tested under the fuel specification requirement in Table B.

Consensus concern: Agreement could not be reached on adding used oil that meets the specifications of part 279.11 to the list of fuels. The suggested alternative was to apply the fuel specification requirement in Table B to used oil to determine its status.

Table B

Materials that are burned to recover energy and meet the following criteria are fuels:

BTU Content:

Alternative A: Have either a minimum BTU content of 2800 BTU/lb on an as-burned basis (reference: minimum BTU content of anthracite culm); or a minimum BTU content of 4000 BTU/lb on a dry basis (reference: non-recyclable wood fiber).

Alternative B: Minimum BTU content of 5000 BTU/lb as burned and able to sustain combustion.

Alternative C: Have sufficient BTU content to ensure a net positive heat value to sustain combustion without additional fuel-energy input beyond auxiliary fuel for startup. The sustainable combustion characteristic may be demonstrated in practice or based on combustion calculations.

Halogen Content:

Alternative A: There should be a separate halogen content for solid, liquid, and gaseous fuels. For solids, contain no more than 2 percent by weight chlorine. (Reference: chlorine content of wheat straw can exceed 3 percent and other biomass can contain 1-2 percent chlorine; dioxin primer indicated that excess chloride [i.e., in excess of the low stoichiometric levels needed to form dioxin] did not affect dioxin formation.)

Alternative B: Same as Alternative A, but contain no more than 1 percent by weight chlorine.

Alternative C: There should be a separate halogen content for solid, liquid, and gaseous materials. The specific limits should be based on typical levels of halogens found in a benchmark solid, liquid, and gaseous fuel.

Alternative D: There should be a separate halogen content for solid, liquid, and gaseous materials. The specific limits are to be determined.

Metals Content:

Alternative A: Contain a concentration of no more than the following:

Metal	Concentration	Reference
Arsenic	25	EPA Table 31, Coal, Site 114
Chromium	25	EPA Table 31, Coal, OFA Test
Cadmium	2.0	Part 279.11 spec. for used oil
Lead	40	EPA Table 31, Coal, Site 114
Mercury	0.3	EPA Table 31, Coal

Alternative B: Contain a concentration based on the used oil specifications of 279.11:

Metal	Concentration	Reference
Arsenic	5	279.11
Chromium	10	279.11
Cadmium	2	279.11
Lead	100	279.11
Mercury	0.3.	EPA Table 31, Coal

Alternative C: There should be a separate metals content for solid, liquid, and gaseous materials. The specific limits should be based on typical levels of metals found in a benchmark solid, liquid, and gaseous fuel.

Alternative D: Contain a concentration of no more than the following based on the proposed comparable fuels exclusion (FR April 19, 1996), for the following metals:

antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, selenium, silver, thallium. (Concentrations to be determined.)

Concern: May want to consider limits for other constituents, such as nitrogen, dioxin, PCBs, and cyanide.

Table C

Materials burned for the primary purpose of recovering chemical constituents are: pulping liquors, spent sulfuric acid, and feedstock for the production of charcoal.

RATIONALE DEVELOPED BY SIX SUBGROUP MEMBERS

Note: Consensus was not reached within the Subgroup on this rationale

In development of a definition of solid waste under Section 129 of the Clean Air Act, the Solid Waste Definition Subgroup thoroughly reviewed the relevant sections of the Solid Waste Act and its implementing regulations (40 CFR 257 and 261). EPA has devoted a considerable amount of effort in defining solid waste for use in hazardous waste regulation (40 CFR 261). These definitions apply to materials that are hazardous wastes, either by inclusion in the 40 CFR 261 subpart D lists of hazardous wastes or by exhibiting the characteristics of a hazardous waste as prescribed in 40 CFR 261 subpart C. The Subgroup, with the assistance of EPA staff from the Office of Solid Waste, reviewed in depth the part 261 provisions as a starting point to recommending a nonhazardous solid waste definition.

While some of the components of part 261 seem to provide a useful basis for the Solid Waste Definition under section 129, it is apparent that the part 261 definitions are complicated in order to address issues of importance to regulations of hazardous waste, but that much of the complexity was unnecessary for a nonhazardous solid waste definition for purposes of combustion under section 129. The full application of the part 261 provisions is too cumbersome for use in section 129. However, certain elements of the part 261 provisions are recommended for inclusion in the section 129 nonhazardous solid waste definition including:

- limiting of section 129 solid waste definition to only discarded materials

- exclusion of fuels from the section 129 definition of solid waste, including those which are exempted from substantive regulation under part 261

- criteria to determine if materials not specifically listed as fuels can be characterized as fuels or solid wastes

Much of the complexity of the part 261 provisions follows from the need to fully define the term discarded in such a way as to ensure that hazardous waste material is not inappropriately discarded or abandoned. The nonhazardous solid waste definition for use in section 129 regulations applies narrowly and as a result does not require the complexity of the part 261 definitions. First, the section 129 solid waste definition deals only with materials that are burned; other means of discarding and the issues they present are not relevant. Second, hazardous wastes are excluded apriori from the section 129 solid waste definition. Hazardous wastes disposal is regulated under the RCRA Subtitle C regulations and hazardous waste incinerators will have their own MACT standard. Third, the regulatory consequence of being a nonhazardous solid waste (as opposed to a fuel) is simply regulation under section 129 rather than regulation under section 112. In either case, emissions of hazardous air pollutants are stringently regulated. With the part 261 hazardous waste definitions, the regulatory result was regulation or no regulation, a decision with potentially serious environmental consequences. Because the section 129 solid waste definition applies so narrowly, only limited elements of the term discard need to be considered and much of the complexity in part 261 can be avoided.

The goal of the Solid Waste Definition Subgroup was to provide a clear, concise definition that would be as self-implementing as possible; that is, there would be no (or limited) need for requests for determinations of whether a material was a solid waste or a fuel or a material burned to recover its chemical constituents.

The recommended section 129 solid waste definition clearly includes as solid waste any materials that are discarded and burned. However, combustion of fuels for energy recovery and combustion of other nonhazardous materials for the primary purpose of recovering chemical constituents does not constitute discard and these materials are excluded from the section 129 solid waste definition. To avoid confusion as to what constitutes recovery of either energy or materials, it was necessary that fuels and materials burned to recover their chemical constituents also be defined. Further, to the extent that fuels are defined narrowly, a provision and criteria for identifying fuels not already listed is needed.

ENCLOSURE I

ITEM 2

Solid Waste Definition

Environmental Caucus

For the past several months, the Industrial Combustion Coordinated Rulemaking ("ICCR") Federal Advisory Committee has reviewed the meaning of solid waste. The meaning of solid waste is important because it is a critical factor in determining whether combustion units are regulated under Section 129 of the Clean Air Act. The ICCR Environmental Caucus agreed with the Coordinating Committee's initial decision to review the meaning of solid waste and provided two representatives on the Solid Waste Task Force. It was the hope of the Environmental Caucus that the Solid Waste Task Force would develop a proposal which underscored the importance of strict adherence with the Clean Air Act and the Resource Conservation Act, and which was consistent with the overarching goal of improving air quality.

This position paper provides a description of the criteria by which the Solid Waste Task Force's proposal on this issue must be evaluated. By way of summary, the Environmental Caucus believes any activity on the issue of the meaning of solid waste must be:

- > consistent with the plain language of the Clean Air Act;
- > consistent with the meaning of solid waste established pursuant to the Resource Conservation and Recovery Act;
- > consistent with Congressional intent for Section 129 as revealed by its legislative history; and,
- > consistent with the ICCR's mandate as a Federal Advisory Committee.

Moreover, the Environmental Caucus believes that any ICCR activity on the issue of the meaning of solid waste must not:

- > engender confusion in the administration of the Clean Air Act or the Resource Conservation and Recovery Act; or,
- > avoid or diminish the environmental protection achieved by regulating combustion units.

This position paper will briefly describe the Environmental Caucus' reasons for advancing these criteria. Based on these criteria, the Environmental Caucus asserts that any proposal which enables waste burning facilities to avoid regulation under Section 129 must be viewed with extreme skepticism. The Caucus questions whether the benefits to the categories of exempted facilities are being achieved at the expense of the fundamental purposes of the Clean Air Act and RCRA. The Environmental Caucus cautions that if regulations are developed based on such a proposal, these regulations are unlikely to withstand a subsequent challenge.

Criterion One - Consistency With The Plain Language of the Clean Air Act

On its face, Section 129 includes the broadest range of incinerator facilities. For example, there are no quantity thresholds in Section 129. Instead, under 129(g)(1), if a facility incinerates "any" solid waste, it is subject to Section 129 and the regulations developed to implement Section 129. The sources for this solid waste are also broadly defined under Section 129, explicitly including solid waste derived from commercial and industrial establishments as well as the general public. Moreover, most waste incinerating facilities will not fall within the three categories of facilities for which Section 129 provides blanket exemptions - metal recovering smelters, small power production facilities burning homogeneous fuels like scrap tires, and air curtain incinerators.

Significantly, Section 129 makes no distinctions between facilities which incinerate solid waste primarily for heat recovery and facilities which incinerate solid waste primarily for waste disposal. Instead, Section 129 directs regulation of any facility which incinerates any solid waste without regard for the facility's purpose for waste combustion. In keeping with this approach, Section 129 makes no distinctions based on Btu content, comparable fuel value or any other characteristics of the solid waste combusted.

Perhaps most importantly, neither the Clean Air Act as a whole nor Section 129 authorize a reworking of the definition of solid waste. Instead, Section 129(g)(6) Congress explicitly states:

The terms solid waste and medical waste shall have the meanings established by the Administrator pursuant to the Solid Waste Disposal Act [42 U.S.C.A. Section 6901 et seq.]. /1

This suggests that even if it were desirable to redefine "solid waste" for purposes of Section 129, Congress provided no statutory authorization for this activity under the Clean Air Act. Instead, pursuant to Section 129 itself, any legislative or regulatory reworking of the definition of solid waste must be established by the Administrator pursuant to RCRA. For the same reason, efforts to rework the definition through "around the edge" clarifications should also be viewed with extreme skepticism; Section 129 explicitly refers to the meanings established pursuant to RCRA, not merely the definitions. Consequently, any attempt to create a new approach to the meaning of solid waste must be viewed with extreme skepticism if it is not grounded in, and entirely consistent with, the meanings established pursuant to RCRA.

To express this criterion plainly, Congress could have excluded facilities based on quantities of wastes combusted or based on the sources of these wastes. Congress did not. Congress could have included an extensive list of categories of waste incinerating facilities which are to be excluded from Section 129. Instead, Congress decided to exclude only three categories of facilities from regulation. Congress could have created a statutory scheme which distinguished between combustion for the purpose of heat recovery and combustion for the purpose of waste disposal, but did not. Congress did not distinguish between sub-categories of solid waste based on Btu content, comparable fuel value or any other characteristic. Finally, Congress could have provided or authorized a new set of meanings for solid waste for purposes of Section 129. Instead, Congress explicitly deferred to the meanings established pursuant to RCRA.

Criterion Two - Consistency With RCRA

The second criterion addresses the substance of the issue. Simply put, this criterion examines whether a proposal is consistent with the meaning of solid waste established and found in RCRA. As a practical matter, the key question is this - for purposes of the meaning of solid waste contained in RCRA and, in turn, Section 129, is non-hazardous discarded material a "solid waste" if it is subsequently used in a combustion process for its fuel value?

A reading of RCRA's regulations strongly suggests that non-hazardous discarded material is solid waste regardless of whether it is subsequently used as fuel in a combustion process.

The most well-developed definition of discarded material established pursuant to RCRA is found in 40 CFR Part 260 et seq. This definition of discarded material is provided as part of the initial step of the analysis to determine if a material is a hazardous waste. Under this analysis, materials which are discarded are solid wastes. Discarded materials include abandoned materials. Materials which are subsequently incinerated, recycled through energy recovery and/or used to make fuel are abandoned and, in turn, properly characterized as solid wastes. Consistent with this definition, even though secondary materials which are reclaimed and returned to the original process in which they are generated generally are not solid wastes, they are solid wastes if the reclamation involves controlled flame combustion or if the reclaimed material is used to produce a fuel. 40 CFR 261.4.

There are three additional characteristics of RCRA which must be highlighted. First, RCRA's regulatory scheme was in place prior to the passage of the Clean Air Act Amendments of 1990. For example, Part 260 - through which virtually all of RCRA flows - was established by 1985. Consequently, when Section 129 refers to the meanings of solid waste established pursuant to RCRA, it is pointing toward meanings which were well-established long before the Clean Air Act Amendments of 1990.

Second, there were no inconsistencies in RCRA's meanings of solid waste at the time of reauthorization of the Clean Air Act and there are none today. Within RCRA's regulations, the older Part 240 definition of solid waste is simply less elaborate than, not inconsistent with, Part 260. That is, the RCRA approach to solid waste is consistent whether it is free-standing (Part 240) or the first part of the determination of whether a material is a hazardous waste (Part 260).

Third, under RCRA, EPA has traditionally used a consistent, conservative approach in determining the meaning of solid waste. This longstanding, prudent approach is reflected in a report entitled Reengineering RCRA for Recycling - Definition of Solid Waste Task Force: Report and Recommendations (U.S. EPA, Office of Solid Waste, April, 1994). Simply, absent an explicit exemption, EPA has regarded secondary materials as solid wastes if they are:

- > burned for energy recovery or used to produce a fuel;
- > used in manner constituting disposal; or,
- > accumulated speculatively (accumulating otherwise exempt secondary materials longer

than allowed by the regulations). Id. at 2-2.

The meanings of solid waste established by the Administrator pursuant to RCRA strongly support the position that the broadest range of solid waste combustion facilities should be regulated under Section 129.

Criterion Three - Consistency With Section 129's Legislative History

The third criterion by which to evaluate any proposal is its consistency with the legislative history of Section 129 of the Clean Air Act. This legislative history reveals clear Congressional intent to regulate the broadest range of incineration facilities.

Section 129 originated in the Senate as part of the Clean Air Act Amendments of 1990 ("the 1990 Amendments"). During the Senate debate on the conference report on the 1990 Amendments Senator Baucus, the floor manager of the bill, entered into the record a detailed analysis (denoted "Clean Air Conference Report") of the bill's provisions. Congressional Record Service, 1 A Legislative History of the Clean Air Act Amendments of 1990 1000-01 (1993) (hereinafter "1990 Leg. Hist. ").

In the section of this analysis pertaining to Title III, under the heading "Municipal Incinerators", the conference report on the 1990 Amendments announces that "the conference agreement includes a provision to control the air emissions from municipal, hospital, and other commercial and industrial incinerators." H.R. Conf.Rep. No. 952, 101st Cong., 2d Sess. 341 (1990), reprinted in 1990 Leg. Hist. 1791 (emphasis added). The inclusion of "other commercial and industrial incinerators" is important evidence of congressional intent.

For purposes of ICCR, the most important part of Section 129's legislative history is the introduction of an amendment to the bill on the Senate floor by Senator Dole. The initial version of Section 129 came from the Committee on the Environment and Public Works. This initial version was limited to large municipal waste incinerators. Instead of mandating emission standards for "solid waste incineration units", as the final version of 129(a)(1)(A) does, the bill mandated standards only for municipal waste incineration unit[s]." 5 1990 Leg. Hist. 7339, 7681-82. Instead of defining "solid waste incineration unit", the bill defined "municipal solid waste incineration unit". 5 1990 Leg. Hist. at 7701.

When the bill reached the floor, Senator Dole successfully proposed an amendment that produced the finally enacted, much broader version of Section 129. The effect of the Dole amendment was to broaden the types of incinerators subject to regulation under Section 129. For example, in offering his amendment, Senator Dole stressed his goal of facilitating "incineration of municipal and other solid waste," and expressed concern that the prior version of the bill would have impeded operation of incinerators other than large municipal solid waste incinerators by failing to develop proactive, national standards which would restore public confidence in other waste combustor categories. ("This change will ensure that hospitals, for example, are not precluded from incineration...Industrial incinerators - those burning only industrial waste from their own facilities - also would have been unable to meet the requirements of the bill."). 4 1990 Leg. Hist. 7049. In describing this broader scope for Section 129, Senator Dole stated:

The Environmental Committee, in trying to address these same concerns made a laudable attempt to set minimum standards for municipal incinerators. In doing so, however, the committee amendments went too far by using large municipal incinerators as the model for all combustors. We have made some changes to the original committee so that real and important differences in size, class, and type of technology used by incinerators in other settings are recognized.

In order to accomplish this broadening of the types of incinerators subject to Section 129, the Dole amendment transformed Section 129(a)(1)(A) from a mandate to regulate "municipal waste incineration units" into a definition of "solid waste incineration unit". Id. at 7256. While the Dole amendment changed significant parts of the language in this subsection, it retained existing language about "any solid waste material from commercial or industrial establishments or the general public (including single and multiple residences, hotels and motels)." Id. Notably, the Dole amendment added a broad definition of "solid waste" to the bill, id. at 7257, (everything regulated as solid waste under RCRA) corresponding to its intention to broaden the types of facilities subject to regulation under Section 129.

The intention to include the broadest range of incinerators in Section 129 is reflected throughout the subsequent Senate debate. During this floor debate, Senator Dole directly stated that "the bill covers all solid waste combustors." Senator Durenberger supported the Dole amendment, stating the new version of Section 129 "...requires EPA to issue new source performance standards for municipal incinerators, for medical waste incinerators, and for incinerators burning commercial and industrial waste." Id. at 7052. Senator Baucus, also speaking in favor of the Dole amendment, noted that "I do not know of anybody who opposes this amendment." Id. at 7053. In describing the enlarged scope of Section 129, Senator Baucus stated:

Moreover, because not all incinerators are alike - they handle different types of waste with different Btu values - the amendment also directs EPA to establish one set of standards for municipal incinerators, another set for hospital incinerators and small units, and another set for industrial incinerators. Specifically, the amendment directs EPA to develop special requirements for smaller incinerators - like those used by hospitals - to address their special needs.

All of these categories of facilities, regardless of waste type or the Btu value of the wastes, were to be regulated under Section 129. In commenting on the effect of proposed U.S. EPA regulations for large municipal waste combustors, Senator Baucus noted that the proposed U.S. EPA action did not "plug one hole" addressed by the Dole amendment:

Unfortunately, EPA's proposal is not adequate in a couple of areas. First, it is limited to larger municipal incinerators. It ignores hospital incinerators, small incinerators, and other industrial

incinerators. Most of these units operate without controls and belch pollutants such as dioxins, furans and arsenic into the air.

The intended effect of the Dole amendment was to bring all of these waste-burning facilities into Section 129. A review of Section 129's legislative history, particularly the genesis of the Dole amendment, reveals clear Congressional intent to regulate the fullest range of combustion units.

Criterion Four - Consistency With ICCR's Mandate

The fourth criterion by which to evaluate ICCR-generated positions regarding the meaning of solid waste is related to limits on ICCR's activities. As a federal advisory committee, the ICCR is limited in scope. The Charter establishing ICCR describes this authority in the following manner:

2. AUTHORITY. It is determined that the establishment of this committee is in the public interest and supports the EPA in performing its duties and responsibilities under Sections 111, 112 and 129 of the Clean Air Act (CAA), as amended in 1990.

ICCR does not have a mandate to range freely through federal environmental laws and regulations, recommending changes as it sees fit. For example, the ICCR has no mandate whatsoever in relationship to RCRA. Yet, for purposes of Section 129, the meaning of solid waste must be derived from RCRA. To the extent ICCR is working toward or contemplating recommendations to the Administrator to change established, RCRA-based meanings of solid waste, it is acting beyond the grant of its authority as a federal advisory committee. Individual participants in ICCR may wish to address this RCRA-based issue, but ICCR is not the appropriate venue. Correspondingly, the Solid Waste Task Force was directed to review the meaning of solid waste and to attempt to develop an approach which is consistent with RCRA and with 40 CFR Part 261, not to develop its own "blank slate" approach.

Criterion Five - Avoiding Confusion In Administration of RCRA and the Clean Air Act

The fifth criterion is whether a proposal will engender confusion in the regulation of solid waste. As noted, there are no inconsistencies in this regulatory scheme. For purposes of RCRA, Parts 240 and 260 are consistent. Although the Part 260 definition is more elaborate, largely because the majority of RCRA flows through this analysis, the definitions mesh. Developing different meanings of solid waste within RCRA and/or strictly for purposes of the Clean Air Act would create a more complex, potentially conflicting, system. Perhaps for this reason, Section 129 simply, prudently and unambiguously defers to RCRA.

As a related issue, it is important to be mindful that Section 261's analysis of solid waste is the first step in the determination of whether a waste is also hazardous. That is, in order to be a hazardous waste, a material must first be classified as a waste. If broad categories of combusted material are no longer classified as wastes, it will create a regulatory loophole.

U.S. EPA risks inconsistent administration of Section 129. It is difficult to imagine any reader of Public Notices contained in the Federal Register on November 2, 1993 and December 28, 1994 being confused by U.S. EPA's interpretation of the facilities which must be regulated under Section 129. For example, in November, 1994, EPA explicitly states that "...the OSWI categories that will be covered by these standards are as follows: 1.MWC's with plant capacities less than 35 Mg/day 2.residential incinerators 3.agricultural waste incinerators 4.wood waste incinerators 5.construction and demolition waste incinerators 6.crematories 7.contaminated soil treatment facilities." To underscore the broad scope of the rulemaking required under Section 129, EPA stated: "All other incinerators burning solid waste other than what has been defined above [large MWCs, MWIs, OSWIs] are probably industrial and commercial waste incinerators."

There is a significant risk of engendering confusion in the administration of the Clean Air Act. Under the Solid Waste Task Force proposal, certain facilities burning certain sub-categories of waste for heat recovery (essentially, boilers) would no longer be regulated for purposes of Section 129. Consequently, two facilities burning precisely the same quantity of the same material and producing precisely the same emissions could be regulated very differently based solely on whether the facility is heat-recovering or not. There are also risks of blatant inconsistencies in such a scheme. For example, a facility which combusts yard wastes would be a municipal waste combustor pursuant to 129(g)(5), but a facility which combusts "vegetative matter that recently was alive" (including grass clippings and leaves) would be entirely exempt from Section 129 under the Solid Waste Task Force proposal. Such distinctions are arbitrary and inconsistent. Such distinctions may have negative, unforeseen consequences with other, already promulgated rules under Section 129. Most importantly, these distinctions are not found in Section 129 nor in the Clean Air Act.

Criterion Six - Will Regulation of Combustion Units Be Avoided or Diminished?

The final criterion addresses what is at stake if a proposal enables a combustion unit to avoid regulation under Section 129. If exempted from Section 129, there is no assurance that hazardous air pollutants from exempted units will be regulated at all. In addition, even if these units are regulated under other provisions of the Clean Air Act, they will be not required to achieve equally protective standards.

Combustion units which are not regulated under Section 129 will fall into Section 112, which mandates the development of MACT standards for hazardous air pollutants. However, unlike Section 129, which contains no quantity thresholds, Section 112 applies to major sources (10 tons per year or more of any hazardous air pollutant, or, combined HAP emissions of 25 tons per year or more). Consequently, any proposal which enables incinerators to avoid regulation under Section 129 may enable non-major sources to avoid HAP regulations altogether. In addition, although it seems inconceivable that combustor categories which emit any amounts of pollutants like dioxins, furans, mercury and cadmium would be left entirely unregulated, in fact there are no assurances these sources will be captured in Section 112's area source program.

Even if sources are regulated under Section 112, the quality of environmental regulation is not comparable to Section 129. Section 129 includes a non-discretionary duty to regulate particulates, opacity, sulfur dioxide, hydrogen chloride, oxides of nitrogen, carbon monoxide,

lead, cadmium, mercury, and dioxins and dibenzofurans. By contrast, Section 112 does not authorize the regulation of criteria pollutants and provides broader discretion on which HAPs will be regulated. Section 129 contains operator certification and emission/operation monitoring requirements which are not found in Section 112, including a provision which allows public inspection of monitoring results. Section 129 mandates an analysis of methods to remove or destroy pollutants "before, during or after combustion", suggesting a more comprehensive analysis of waste stream reduction, reuse and recycling than required under Section 112. Unlike Section 112, new sources under Section 129 are subject to siting requirements which minimize, on a site specific basis, potential risks to public health and the environment.

Notably, the Solid Waste Task Force's recommendations and accompanying rationale are silent on the critical issue of how pollutants from exempted facilities will be regulated, if at all. Having proposed exempting these facilities from Section 129, the Solid Waste Task Force offers no assurances that these facilities will be subject to any other regulations. Having objected to regulation under Section 129, will similar objections be made to these sources being regulated under Section 112 as major or area sources ? Consequently, the Environmental Caucus paper must conclude with a troubling, fundamental question. Putting aside momentarily the benefits for certain waste burning facilities, how are the goals of improved air quality and enhanced public health achieved by narrowing Section 129 ?

ENCLOSURE I

ITEM 3

Solid Waste Definition Industry Caucus

The Solid Waste Definition Industry Caucus Supports The Overall Subgroup Approach

The ICCR Environmental Caucus has issued a position paper, which sets out criteria by which it believes a Clean Air Act Section 129 definition of solid waste should be evaluated. The Environmental Caucus says these criteria dictate that the Section 129 definition of solid waste be the same as that developed by EPA for its Resource Conservation and Recovery Act (“RCRA”) Subtitle C hazardous waste regulations. They also state that regulations based on the Coordinating Committee Solid Waste Definition Subgroup’s (“Subgroup”) consensus recommendation “are unlikely to withstand a subsequent challenge.” The Solid Waste Definition Industry Caucus disagrees.

The Subgroup definition of solid waste represents months of hard work by EPA and others. It is a thoughtful product, which balances environmental protection with the practical need of energy producers and consumers to make full use of materials that have economic and energy value. The Subgroup definition tracks the literal command of Section 129 to adopt the “meanings [of solid waste] established by [EPA] under the Solid Waste Disposal Act.” It also reflects several of the basic tenets of those definitions, *e.g.*, fuels and fuel-like materials burned for energy recovery are not wastes, and in-process materials are not discarded and cannot, therefore, be solid wastes. Moreover, the Subgroup definition effectuates Congressional and EPA policy by encouraging waste minimization and recycling, and reducing reliance on non-renewable fossil fuel. Congress, for example, announced in the Energy Policy Act of 1992 a strong national policy encouraging production and use of alternative fuels, which include

methanol, denatured ethanol, and other alcohols...hydrogen; coal-derived liquid fuels; fuels (other than alcohol) derived from biological materials...and any other fuel the Secretary [of Energy] determines, by rule, is substantially not petroleum and would yield substantial energy security benefits and substantial environmental benefits.

Energy Policy Act of 1992, 42 U.S.C. § 13211(2). The Environmental Caucus criteria undercut this Congressional policy because they would require an overly narrow definition of fuel.

For all of these reasons, the overall Subgroup approach represents sound public policy choices and is fully defensible.

The Subgroup Definition Of Solid Waste Is Consistent With The Plain Language Of The Clean Air Act And The Meanings Of Solid Waste Established By EPA Under The Solid Waste Disposal Act.

The Environmental Caucus says that the definition of solid waste must be consistent with the plain language of Section 129 and the definition of solid waste established by EPA under RCRA. We agree. But this does not mean that the Section 129 definition of solid waste must be based solely on the RCRA Subtitle C definition.

Section 129 requires that the terms “ ‘solid waste’ and ‘medical waste’ shall have the meanings established by the Administrator pursuant to the Solid Waste Disposal Act.” The Environmental Caucus says this necessarily points toward EPA's solid waste definition in its hazardous waste rules codified in 40 C.F.R. Part 260 *et seq.* We disagree. The Environmental Caucus misreads “Solid Waste Disposal Act” to mean only the portions of that Act and EPA rules, which address hazardous wastes. But Congress did not say that. Section 129(g)(6) refers to the whole of the Solid Waste Disposal Act, which covers both non-hazardous and hazardous solid waste. Congress could not have limited EPA only to the definition of hazardous solid waste, because when Congress enacted Section 129, it knew that the Part 261 definition of solid waste does not generally apply to the kinds of non-hazardous solid waste addressed by Section 129.

Section 260.10, the general definition section for the Agency's hazardous waste rules, states that solid waste “means solid waste as defined in §261.2 of this chapter.” However, according to Section 261.1, the definition in Section 261.2 applies only to hazardous wastes:

The definition of solid waste contained in this part applies only to wastes that also are hazardous for purposes of the regulations implementing Subtitle C of RCRA.
For example, it does not apply to materials (such as non-hazardous scrap, paper, textiles, or rubber) that are not otherwise hazardous wastes and that are recycled.

40 C.F.R. § 261.1(b)(1) (emphasis added). Significantly, the Environmental Caucus says not one word about this “meaning[] established by the Administrator pursuant to the Solid Waste Disposal Act.” Because Section 129 of the Clean Air Act addresses only combustion of *non-hazardous* solid waste, the quoted language makes it unlikely that Congress intended EPA to rely exclusively on the Section 261.2 definition.

Congress could just as well have had in mind EPA's definitions of non-hazardous solid waste like those adopted in the Agency's Guidelines For The Thermal Processing of Solid Wastes (40 C.F.R. § 240.101(y)), Guidelines for Solid Waste Storage and Collection (40 C.F.R. § 243.101(y)), Guidelines For Identification Of Regions And Agencies For Solid Waste Management (40 C.F.R. § 255.2), Criteria For Classification Of Solid Waste Disposal Facilities And Practices (40 C.F.R. § 257.2), and Criteria For Municipal Solid Waste Landfills (40 C.F.R. § 258.2). These definitions are remarkably consistent; each uses essentially the same definition of solid waste, which tracks the statutory definition in Section 1004 of the Solid Waste Disposal Act. They are not only consistent with RCRA, they are specifically designed to implement it. *See, e.g.*, 40 C.F.R. § 258.1(a) (“The purpose of this part is to establish minimum national criteria under the

Resource Conservation and Recovery Act . . .”) and 40 C.F.R. § 257.1(a) (“These criteria are for use under the Resource Conservation and Recovery Act . . .”).

The solid waste definition approach thus far taken by the Subgroup is completely consistent with the foregoing “meanings established by the Administrator pursuant to the Solid Waste Disposal Act.” For example, EPA's Criteria For Municipal Solid Waste Landfills defines solid waste to mean

any garbage, or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities . . .

40 C.F.R. § 258.2.

The most recent version of the Subgroup definition adopts the “garbage, refuse, sludge” language EPA uses in Section 258.2 and in all of its non-hazardous solid waste definitions. The remainder of the Subgroup definition addresses the “other discarded material” component of EPA's definition. There is no inconsistency here.

The legislative history cited by the Environmental Caucus does not shed any light on this matter. The Environmental Caucus position paper states that Congress intended Section 129 to cover a broad range of solid wastes and “[t]his intention is best captured in Senator Dole's floor statement . . . that ‘the bill covers all solid waste combustors.’” But this floor statement begs the question. It uses the term “solid waste,” it does not define it. Moreover, the Subgroup approach in fact covers a broad range of solid wastes that is coextensive with both the RCRA statutory and regulatory definitions. Congress commanded nothing more.

Finally, the broad focus of the Subgroup's approach toward defining solid waste ensures thorough regulation of combustion units. The current version of the definition covers units burning garbage, refuse, sludge, and other solid wastes whether they are liquid, semi-liquid, or contained gaseous material. Only units burning fuels, fuel-like materials that meet stringent specifications, in-process materials, or other units explicitly exempted under Section 129(g)(1) would not be covered by Section 129 under the current approach. But such units would be addressed under Section 112's stringent MACT standards or, if EPA has any remaining concerns about coverage, under the Section 112(f) residual risk standards to which Section 129(h) refers. The Environmental Caucus' assertion that non-major HAP sources escape regulation under Section 112 incorrectly ignores the area source provisions of Section 112 that are designed to handle minor sources that warrant control. Although there are some differences between Sections 112 and 129, they are differences in form, not substance. The Environmental Caucus thus contends, incorrectly, that any combustion unit that is “exempted from Section 129” will escape regulation or will not be required to achieve equally protective standards.

Necessary Improvements To The Work Group Approach

The Subgroup definition consists of four parts. The first lays out the Subgroup's general approach that solid waste consists of discarded materials and not fuels or materials burned for the primary purpose of chemical recovery. The second consists of a list of fuels (Table A)¹; the third, a list of fuel specifications (Table B),² and the fourth, a list of materials burned for chemical recovery (Table C). The Solid Waste Definition Industry Caucus generally supports the Subgroup approach, but we believe that it leaves a number of important issues unresolved. These issues concern the definition of biomass, a de minimis threshold, the addition of process engineered fuels to Table A, the need for reasonable Table B fuel criteria, and the addition to Table A of materials already determined by EPA to be fuels (*e.g.*, on-specification used oil fuel). We discuss each of these open issues, below.

A. The Definition of Biomass Should Not Be Limited To Recently Alive Vegetative Material.

Biomass is carbonaceous material built by living organisms primarily from atmospheric carbon dioxide. As a fuel, it is renewable in a contemporary time frame (<1 to 50 years) and therefore unique in that upon burning it provides no net increase to the atmospheric carbon dioxide levels believed to contribute to global warming. In keeping with the President's global warming initiative, the use of traditional (and new) biomass fuels should be encouraged to the maximum extent practicable.

The Subgroup definition of biomass fuels falls short of identifying the full range of biomass in two ways. First, the reference to materials that were "recently alive" needs to be viewed relative to the geologic time frames necessary to create the alternative to biomass fuels, *i.e.*, fossil fuels. Any relatively contemporary material provides the carbon balance benefit of biomass and should be so recognized.

Second, the consensus definition of biomass is inappropriately limited to "vegetative" materials. EPA should recognize that biomass legitimately includes protozoan-based materials, as well. For example, in the pulp and paper industry, primary clarifier solids (mostly non-recyclable "vegetative" fiber and inorganic inerts), can be mixed with smaller amounts of secondary clarifier

¹ It is clear that fuel burned to produce energy is not solid waste under any definition of solid waste that has been adopted -- or that could permissibly be adopted -- under the Solid Waste Disposal Act. The conclusion that materials identified as fuels on Table A are not wastes when burned to produce energy is therefore justified regardless of the specific definition of solid waste employed. Accordingly, EPA should retain Table A to embody specific regulatory results that have a justification independent of the particular regulatory definition of solid waste used to determine the status of other materials under Section 129 of the Clean Air Act.

² Identification of fuels in Table A and fuel criteria in Table B is essential to development of a practical way to distinguish waste combustion units that are incineration units covered by Section 129, from combustion units that burn legitimate fuels and are covered by Section 112.

solids (protozoan biomass) resulting in a satisfactory fuel. When properly de-watered, the secondary clarifier solids add significantly to the heat content of the fuel. The great majority of this material that is not burned in boilers is landfilled, where the cell structures degrade into CO₂ just as they do in boilers, but without the benefit of heat recovery.

EPA should conform its definition of biomass with that adopted by Congress in the Biomass Energy and Alcohol Fuels Act of 1980. There, Congress established a national program for increased production and use of biomass energy based on its finding that “the dependence of the United States on imported petroleum and natural gas must be reduced by all economically and environmentally feasible means, including the use of biomass energy resources.” 42 U.S.C. § 8801. To that end, Congress defined “biomass” to mean “any organic matter which is available on a renewable basis, including agricultural crops and agricultural wastes and residues, wood and wood wastes and residues” *Id.* at § 8802. Congress did not limit “biomass” to recently alive vegetative materials. EPA should, therefore, broaden the Subgroup’s recommended definition of biomass to include protozoan-based material.

B. The Solid Waste Definition Should Include A *De Minimis* Threshold.

EPA should not stigmatize combustion units, by regulating them under Section 129 as solid waste incinerator units, if they burn only relatively small quantities of solid waste. EPA has authority under Section 129 to establish a *de minimis* threshold for combustion units. Section 129(g)(6) incorporates the definition of “solid waste...established by the Administrator pursuant to the Solid Waste Disposal Act.” At least one such definition incorporates a *de minimis* threshold. EPA’s Guidelines For the Thermal Processing Of Solid Wastes apply only to thermal processing units that “are designed to process or which are processing 50 tons or more per day....” 40 C.F.R. § 240.100. EPA has also adopted analogous *de minimis* exemptions in its hazardous waste regulations. (*See, e.g.,* exemption of mixtures of solid waste and *de minimis* amounts of discarded commercial chemical products from definition of hazardous waste, 40 C.F.R. § 261.3(a)(2)(iv)(D)).³

C. Process Engineered Fuels Should Be Added To Table A.

Process Engineered Fuel (“PEF”) is a manufactured product sold to industrial and utility users as an energy source. In its most common form, PEF is a solid fuel derived from processed

³ Section 129(g)(1) defines “solid waste incineration unit” to mean “any facility which combusts any solid waste material” Some ICCR Subgroup participants believe that the phrase “any solid waste material” precludes a *de minimis* threshold. It does not, because EPA’s authority to establish such a threshold is grounded on the term “solid waste material,” which EPA may define to include thresholds. It is not therefore diminished by the word “any.” To the contrary, Congress’ addition of the word “material” to the term “solid waste” suggests that “any” means “any type or kind of solid waste,” as opposed to “any amount or quantity of solid waste.” Otherwise, the word “material” would be mere surplusage, even though Congress is presumed to intend each word it uses to have *some* meaning.

paper and plastics. Because it is manufactured as a primary product, marketed, and sold into the fuel market in competition with other fuels, PEF should be clearly recognized as a fuel, not a waste.

This is further supported by the overall environmental benefits associated with PEF, which include waste minimization, resource conservation, and pollution prevention. Because it is a manufactured product designed to give predictable emissions, including reduced greenhouse gas emissions; ash; and burning characteristics, and because plastics provide excellent Btu value to the fuel, PEF equals or betters, in many applications, other recognized fuels such as biomass, wood, and coal refuse fuels. Tests have shown that emissions and heating values can be superior to the fuels that PEF would displace. As a manufactured and marketed fuel product, PEF is not burned in industrial waste incinerators, but is fired in heat recovery boilers to produce useful steam and electricity.

We believe the facts associated with PEF production and use support its inclusion on the Table A list of fuels. It is not appropriate to regulate PEF as a solid waste under Section 129. Manufacturers and users of PEF need the assurance that PEF is not a waste so that the PEF industry can grow, assuring realization of its full environmental and economic benefits.

D. EPA Should Adopt Reasonable Fuel Criteria In Table B.

The final report issued by the Solid Waste Definition Subgroup includes Table B, which consists of criteria for determining whether a material that is not listed in Table A is a fuel. The rationale for establishing Table B was the recognition that Table A is a relatively narrow list of obvious fuels and, as such, would not provide the regulatory flexibility under the Clean Air Act necessary (1) to achieve maximum environmental benefit at reasonable cost, and (2) to allow for future development of acceptable fuels. The important environmental benefits of fuel criteria discussed by the Subgroup were waste minimization, reduced life-cycle emissions, and increased energy conservation and efficiency. The Solid Waste Definition Industry Caucus supports the concept of fuel criteria and urges EPA to adopt such criteria in its solid waste definition.

We recommend that the EPA follow the direction of the Subgroup and finalize a list of reasonable fuel criteria so that materials that have historically been used as fuels by industry, or whose use has clear environmental, economic, and performance benefits, can be used for energy recovery while meeting appropriate regulatory requirements.

To achieve sought after environmental benefits and sustainable economics, Table B should not be based on a desire to force the use of environmentally preferable fuels, but on the fundamental question of whether a material is being used as a fuel to efficiently recover energy or simply burned for disposal. Table B, therefore, should not be based on a comparison to a benchmark fuel such as natural gas. The criteria should be based on a comparison with the range of commercially viable fuels that someone would pay for as a source of energy, such as coal, fuel oil, *et cetera*.

We continue to support our original proposal (described as “Alternative A” in the Subgroup’s consensus paper). However, to the extent Alternative A may be unacceptable, we

believe that the used oil fuel specifications could form the basis for acceptable criteria. We do not see a need for separate criteria for gaseous, liquid, and solid fuels, but if EPA perceives a need to address this issue, then EPA should consider a composite benchmark approach, based on the characteristics of, and constituents found in, the full range of solid, liquid, or gaseous fuels.

E. Table A Should Include Materials Already Recognized By EPA To Be Fuels Under RCRA.

Under RCRA, EPA has recognized after years of study and analysis that certain materials are fuels, or are more fuel-like than waste-like. Such materials should be added to Table A.

The most important example would be that of off-specification fuels. EPA has determined that such fuels are still considered fuels (and not solid wastes) when burned for energy recovery. *See* 50 Fed. Reg. 630 n.18 (Jan. 4, 1985). In the absence of specific mention, it would not necessarily be clear that such off-specification fuels are classified as fuels in the current Table A.

Another example would be that of certain oil-bearing residuals that meet the used oil fuel specification in 40 C.F.R. § 279.11. *See* 40 C.F.R. § 261.6(a)(3)(iv). In effectively classifying these materials as fuels, where they meet the specification, EPA said that “the resulting fuels will pose no greater environmental hazard than the virgin fuels that would be burned in their place.” 50 Fed. Reg. 49,170 (Nov. 29, 1985).

F. Used Oil Fuel That Meets The Specifications In 40 C.F.R. § 279.11 Should Be Included In The Table A List Of Fuels.

Used oil fuel that meets the used oil fuel specification is effectively exempt from RCRA regulation. This for a very good reason. The used oil fuel specification is risk-based. As EPA said in 1985, “Given that oil meeting specification parameters may be burned in nonindustrial facilities like apartment and office buildings, the specification is intended to be protective under virtually all circumstances.” 50 Fed. Reg. 49,180 (Nov. 29, 1985).

Moreover, the low level of contaminants in on-specification used oil fuel ensure the fuel is indeed more fuel-like than waste-like. *See* 50 Fed. Reg. 49,189 (Nov. 29, 1985): “[On-specification] used oil fuel poses no greater risk than virgin fuel oil and, once it enters the commercial fuel oil market, should not be regulated differently than virgin fuel oil.” Indeed, 40 C.F.R. Part 279 refers frequently to the used oil specification as the used oil “fuel” specification. *See, e.g.*, 40 C.F.R. §§ 279.70(a)(2), 279.72(a).

Burning of on-specification used oil fuel in industrial and utility boilers and furnaces is extremely common across many different industries because generation of used oil is itself virtually ubiquitous. Such burning is an economically efficient and environmentally sensible way to manage used oil. It would make no sense to regulate such process units as “solid waste incinerators” on the basis of their burning used oil fuel as a supplement to the virgin fuels that the used oil fuel so closely resembles. Therefore, on-specification used oil fuel should be added to the Table A list of fuels.

ENCLOSURE II
ITEM 1

Test Plan for Reciprocating Internal Combustion Engines

ICCR Coordinating Committee

**Reciprocating Internal Combustion Engine (RICE) Work
Group**

Purpose of Briefing

Context for Plan Development

Test Plan Development Process

Content of Test Plan

Cost and Schedule

O Purpose of Briefing

- o Provide the Coordinating Committee background on the need for RICE emission testing
- o Inform the Coordinating Committee about the process to develop the test plan and the contents of the plan
- o Provide the Coordinating Committee an opportunity to provide guidance relative to coordinating this testing with other Work Groups
- o Inform the Coordinating Committee about the costs and schedule to conduct this Test Plan

O Context for Plan Development

- o Coordinating Committee directed Work Groups to identify testing needs during March 1997 meeting
- o EPA stressed that very limited funds would be available for HAPs emissions testing
- o Work Group reviewed test reports for existing data
 - > Unexplained variability in emissions data included in ICCR Emissions Database for RICE
 - > Emission factors for formaldehyde emissions from natural gas-fired engines over 6 orders of magnitude
 - > Multiple emissions data gaps identified

O Context for Plan Development (Continued)

- o Work Group identified 3 possible goals for emissions testing under ICCR:
 1. acquire additional emissions data to assist the Work Group in determining the effectiveness of after-treatment control devices to reduce formaldehyde and other HAPs
 2. acquire additional emissions data to assist the Work Group in determining the effectiveness of combustion modifications to reduce formaldehyde and other HAPs
 3. acquire additional emissions data that can assist the Work Group in determining typical emissions for engines throughout the operating range
- o Work Group designed test plan around Goal #1 for the following reasons:
 - > Emissions data to demonstrate the effectiveness of possible MACT control devices for existing RICE is a data gap in the ICCR Emissions Database for RICE
 - > Understanding the effects of combustion modifications on HAPs is in its infancy, and would require a very extensive research program to identify potential control techniques, along with confirming testing
 - > EPA has endorsed the use of ICCR emissions testing dollars to achieve this goal

O Context for Plan Development (Continued)

- o Work Group has further focused the plan to address the effectiveness of after-treatment control devices:
 - > Effect on formaldehyde is primary focus
 - > Effect on other HAPs is secondary focus
- o Work Group added this focus for the following reasons:
 - > Formaldehyde is a product of incomplete combustion and generally is the HAP emitted in the greatest quantities from RICE
 - > Work Group was able to identify possible MACT for formaldehyde based on the results of emissions testing conducted by industry -- there is less understanding of possible MACT for other HAPs

O Process to Develop Test Plan

- o Emissions Subgroup formed and assigned task to identify testing needs for RICE Work Group [19 members, all stakeholders represented]
- o First step: Identify pollutants to be tested
 - > Presented list to Coordinating Committee in July
 - > Comments on pollutants accepted until September 5
- o Second step: Identify test methods to use

O Process to Develop Test Plan (Continued)

o Third Step: Address Engine Considerations:

+ Operating Conditions

- > Based on industry experience with criteria pollutants, such as NO_x, believe operating conditions can affect HAP emissions and efficiency of controls
- > Need to conduct testing over full operating range
- > Need person with knowledge of engine operations on site to establish condition of engine
- > Need to collect adequate operating parameter data to relate operating conditions and emissions

+ Diversity of Existing Engine Population

- > Over 3,000 possible combinations
- > Operating cycle (spark ignition or compression ignition)
- > Fuel
- > Scavenging cycle (2-stroke or 4-stroke)
- > Air-to-fuel ratio (rich or lean)
- > Make and model
- > Size
- > Driven equipment and application

O Process to Develop Test Plan (Continued)

- o Work Group has put a lot of effort into development of this Test Plan
 - > Plan developed over past 8 months
 - > Numerous conference calls to develop content
 - > Experts provided input on key components:
 - > Testing and Monitoring Protocol Work Group
 - > Engine and other testing experts
 - > Components of plan reviewed at May, September, & October Work Group meetings
 - > Multiple drafts of plan reviewed by Work Group
 - > Work Group consensus on final plan achieved on October 30, 1997

O Content of Test Plan

- o Four Tests Proposed
- o Components of Tests:
 - > Fuels, Engines, and Emission Controls to be Tested
 - > Matrix of Operating Conditions
 - > Pollutants to be Tested
 - > Test Methods to Quantify Pollutants

O Content of Test Plan (Continued)

- > Two most popular fuels to be tested: Diesel Fuel and Natural Gas

- > Engines to be Tested

- Diesel (CI) - - Caterpillar 3500

- Natural Gas (SI)

- - Clark TLA, turbocharged, 4-stroke, lean-burn

- - Waukesha 7042 GL, turbocharged, 4-stroke, rich-burn

- - Ingersoll Rand KVG, naturally aspirated

- o Controls to be Tested

- > Focus on devices identified as possible MACT

- > Oxidation catalysts for lean-burn engines

- > Non-selective catalytic reduction (NSCR) three-way catalysts for rich-burn engines

- o Matrix of Operating Conditions to be Examined

- > Four corners of torque/speed envelope

- > Air-to-fuel ratio sensitivity

- > High speed and low load; Low speed and high load

- > Air manifold temperature and jacket water temperature sensitivity

- > Engine balance sensitivity

O Content of Test Plan (Continued)

- o Pollutants to be Tested / Test Methods

- > Test methods selected that will provide direct measurement and reporting of pollutant concentrations on-site, whenever possible

- > Direct Interface Gas Chromatograph/Mass Spectrograph (GCMS) (BTEX, 1,3-butadiene, hexane)
- > Fourier Transform Infrared (FTIR) (aldehydes, NOx, CO)
- > EPA method 25A (THC and methane)
- > ISO 8178 (particulate matter)
- > CARB 429 (naphthalene and PAHs)
- > Testing to be conducted to achieve lowest practical detection limits for all compounds
- > Fuel testing for metals

o Possible Test Sites

- > Natural gas-fired units:
Engines and Energy Conversion Laboratory,
Colorado State University, Fort Collins, Colorado
- > Diesel unit: To be determined

o Cost to Conduct Test Plan: \$610,000 (estimate)

o Next Steps: November 1997 - Solicit funding from Work Group members
Winter 1997/1998 - Work Group to confirm test sites
Spring 1998 - Conduct testing

ENCLOSURE II

ITEM 2

MINORITY RECOMMENDATIONS

While supporting in general the test plan presented at the November 19, 1997 ICCR Meeting, particularly as it applies to natural gas firing, some Coordinating Committee members expressed concern that the testing is not sufficient for "other fuels" and may not be sufficient for diesel fuel firing. Those Coordinating Committee members support additional testing, either as a phase 2 after the proposed (phase 1) testing is complete, or as part of phase 1 testing.

With respect to "other fuels," a minority of Coordinating Committee members argued that testing is needed because there are over 1000 I.C. engines reported to be burning "other fuels," some of which have the potential to produce much higher emissions of HAPs than gas or diesel firing. For some of these fuels, including landfill gas, dioxin testing should be done.

With respect to diesel oil firing, the minority position is that testing of more than one unit should be done because there are about 10,000 of these units and the potential for HAP emissions per unit is greater than for gas firing. Also, testing for dioxin emissions should be considered, but at a lower priority than for "other fuels."

ENCLOSURE II

ITEM 3

MAJORITY RECOMMENDATIONS

The RICE Work Group proposes four emissions tests in the enclosed plan, three tests on natural gas-fired engines, and one test on a diesel-fired engine, at an estimated cost of \$610,000. The RICE Work Group selected natural gas and diesel as the two fuels to be tested because most stationary RICE use one of those two fuels.

According to the RICE Population Database assembled by EPA for the ICCR process, 95 percent of all stationary engines use either natural gas or diesel fuel. Of over 28,000 entries included in the RICE Population Database, more than 26,500 indicate natural gas or diesel as the fuel used. Less than 1,500 engines, or five percent, of the total entries indicate “other fuels” are used. “Other fuels” include gasoline, kerosene, digester gas, landfill gas, etc. Landfill gas units are only 130 of the 1,500 engines, or 0.5% of the total number of engines. The RICE Work Group has made no determinations about whether they think engines using “other fuels” should be regulated under ICCR and has not identified specific testing needs related to these “other fuels.”

The RICE Work Group realizes that the plan does not address all the questions that must be answered regarding emissions from RICE and the effectiveness of potential maximum achievable control technology (MACT), but has determined that the plan will provide additional emissions data to address key data gaps that have been identified in the ICCR Emissions Database. Therefore, the Work Group developed the test plan as one that is achievable given the budget constraints within the ICCR process, and one that addresses most of the stationary reciprocating internal combustion engines that may be included in any future MACT standard for RICE, i.e., natural gas-fired engines and diesel-fired engines.

The Work Group also considered the issue of dioxin testing. Based on information presented to ICCR participants by two experts in the field of dioxin formation, there appears to be little or no probability that dioxin will be formed during the reciprocating internal combustion process of natural gas or diesel fuel. Therefore, the Work Group concluded that there was insufficient basis to include dioxin testing in the test plan.

In closing, please note that both the minority and majority positions support the use of the proposed funds to conduct the four proposed emissions tests included in the enclosed plan. The minority position calls for testing in addition to the four tests proposed.

ENCLOSURE III
ITEM 1

List of Pollutants Identified for Emissions Testing of Gas Turbines

ICCR Coordinating Committee

Combustion Turbines Source Work Group

O Available Emissions Data

- o The current emissions database has been built from emission test reports for HAPs.

- o Number of gathered tests:

> Natural Gas	26
> Diesel (#2 Fuel Oil)	12
> Landfill Gas	11
> Digester Gas	3
> Refinery Gas	1
>Field Gas	1

- o Qualitative description of emissions database:

- > WG reviewed all gathered reports for inclusion of necessary operating parameters. Results indicate incomplete references to operating conditions during testing
- > Test reports are not available for all fuels
- > No add-on control devices were tested

O Selected Pollutants For Testing

- > The Work Group has completed discussion on the list of pollutants for all fuels
- > The Work Group reached consensus on the list of pollutants for all fuels, with the exception of dioxin from landfill gas-fired turbines. The minority position on this issue is to include dioxin on the list of pollutants for landfill gas-fired turbines.
- > Criteria pollutants will be measured simultaneously with HAP pollutants. The criteria pollutants include carbon monoxide (CO), oxides of nitrogen (NOx), total hydrocarbons (THC), and particulate matter (PM) (for liquid fuels)
- > List of pollutants will include, at a minimum, ALL pollutants for natural gas-fired turbines regardless of fuel
- > Only pollutants measured at levels higher than the corresponding detection limits are included
- > The metallic HAPs (identified by an * on the pollutant lists) will be measured using fuel analysis.

O Non-detected Pollutants

- > Natural Gas: 1,3-Butadiene Cadmium Chromium(VI)
- > Manganese
- > Lead
- > NMDA
- > Propylene Oxide
- > NMOR
- > TMA

O Natural Gas

> The list of HAPs for natural gas-fired turbines include all HAPs which were reported at levels higher than the corresponding test method detection limit as well as the HAPs referenced by the ICCR TMPWG and EPRI

> 2,2,4-Trimethylpentane

> Acetaldehyde

> Acrolein

> Arsenic Compounds*

> Benzene

> Biphenyl

> Ethylbenzene

> Formaldehyde

> Hexane

> Mercury Compounds*

> Methanol

> Naphthalene

> PAH

> Phenol

> Styrene

> Toluene

> Xylene (o, m, & p)

(*Metallic HAPs- will be tested in fuel analysis)

O #2 Fuel Oil:

- > The list of HAPs include the pollutants identified under natural gas-fired turbines and the following:

Beryllium Compounds*
Chromium Compounds*
Lead Compounds*

Cadmium Compounds*
Manganese Compounds*
Nickel Compounds*

(*Metallic HAPs- will be tested in fuel analysis)

O Landfill Gas:

- > The list of HAPs include the pollutants identified under natural gas-fired turbines and the following:

Acetonitrile
Tetrachloroethylene

Methylene Chloride
Vinyl Chloride

- > Note: There is non-concurrence on excluding dioxin from the list of pollutants for landfill gas-fired turbines.

O Digester Gas:

- > The list of HAPs include the pollutants identified under natural gas-fired turbines and the following:

Methylene Chloride
Selenium Compounds*

Tetrachloroethylene

(*Metallic HAPs- will be tested in fuel analysis)

O Refinery Gas, Field Gas:

- > The list of HAPs include the pollutants identified under natural gas-fired turbines.

ENCLOSURE III

ITEM 2

MINORITY RECOMMENDATIONS

All combustion devices burning landfill gases were placed in the moderate category for dioxin formation potential in the primer presentation given to the ICCR. No device burning landfill gas was placed in a category below moderate. Landfill gas turbines were not specifically listed.

The primary reason for concern about dioxin formation from landfill gas combustion is the presence of the appropriate ingredients in the combustion zone. Landfill gases contain halogenated species and other complex organics which, when burned, have the potential to create dioxin. Complex organics was listed at the dioxin primer as a key condition likely to lead to dioxin formation. Also, the amount of chlorine present is definitely sufficient. This was a second listed condition. Municipal landfills contain quite a bit of metal. There is potential for metals to vaporize and become mixed with the gas, supplying the requisite metals listed as a third condition in the primer materials.

Many on the GTWG maintain that the inherent good combustion practices (GCP) of a turbine ensure that no dioxin can be created or, if any is present, would be completely burned. We are not at this time convinced that GCP is maintained uniformly throughout the landfill gas turbine industry. Speaking with a landfill gas turbine operator in Southeast Wisconsin, we found that his turbine was prone to major swings in burning temperature due to the quality of the fuel and the ambient conditions. He said that the temperature dipped below 1,000 F twice a day -sometimes as low as 350 F, allowing the combustion to pass through the temperature window required for dioxin formation. If poor combustion is possible, then the requisite particulate formation is also possible. It is important to note that other devices burning landfill gases, such as boilers, were listed in the moderate category for dioxin formation potential, even though good combustion practices were noted.

Nor have we seen evidence that post combustion conditions are uniformly preventative of dioxin formation. Dioxin formation potential may exist post-combustion, depending on the exhaust and stack design of the facility. We are not aware of cold quench techniques being uniformly applied to prevent downstream formation.

There are references that confirm that dioxin is emitted from landfill gas combustion. See Lahl, U., Wilken, M., Zeschmar-Lahl, and Jager, J. PCDD/PCDF balance of different municipal waste methods. Chemosphere 23 (8-10): 1481-1489 (1991). "Exhaust gas after combustion of landfill gas in flares or fires can contain considerable amounts of dioxin. We found 75-217 pg (TE)/m³. The study noted that other authors report values up to nearly 1 ng (TE)/m³."

Also see Jones, K. Comparing air emissions from landfills and WTI plants. Solid Waste technologies. March/April 1994. This paper confirms that dioxin has been measured in emissions from flares and internal combustion engines burning landfill gas in Germany. See GH Edulgee, ERM P Dyke, ETSU, AEA Technology PW Cains, Technical Products Division, AEA Technology.

Susan Thornloe, Senior Project Officer with USEPA-ORD wrote me that "all the data on by-product emissions associated with LFG combustion is that it is similar to emissions from controlled MWC". E-mail of 3 Nov 97, 6:57 p.m.

Dioxin is extremely toxic. It is included on the EPA's Early Reductions Program List of High Risk Pollutants (Table 1) with a weighting factor of 100,000. No other pollutant is weighted at greater than 1,000. Dioxin is also very bioaccumulative (rate = 250,000 - 1,000,000 : 1. EPA has reported that most adults and children already have levels of dioxin in their bodies at or near the concentrations that cause fetal and immune system problems. I have small children that are being poisoned by dioxin. I am being poisoned by dioxin. You are. Therefore, any additional loading to the environment represents an unacceptable risk. Any dioxin releases are significant, even those which are only temporary or occasional, however brief.

The Combustion Turbines work group is in the process of evaluating whether operational practices may be useful as control technologies for gas turbines. The question of whether dioxin is formed at landfill gas turbines under certain operating conditions is particularly critical for us to answer because if dioxin is created under certain conditions or practices, it would certainly influence whether or not we choose to adopt operational methods or combustion practices as part of our MACT.

ENCLOSURE III

ITEM 3

MAJORITY RECOMMENDATIONS

The majority of the stakeholder members of the Combustion Turbine WG (users of turbines, manufacturers, vendors, and EPA) believe that it is not a high priority to test for dioxin when combustion turbines burn landfill gas because the conditions for dioxin formation are very unlikely to be present and because data from two tests show non-detect and levels that are at the ambient background 4-5 picograms I-TEQ per m³. Other factors that reduce the priority of testing is that landfill gas is used by less than half of one percent of all the turbines in the U.S. and the cost to test for dioxin is very high.

Conditions for dioxin formation are very unlikely to occur in combustion turbines. EPA and the Coordinating Committee sponsored a Dioxin Formation Presentation in September 1997 which was conducted by EPA and independent dioxin experts. The information presented during the presentation was used to conclude that combustion turbines burning any fuel are very unlikely to form dioxin. The conditions more likely to lead to dioxin formation, listed in order of relative importance are:

1. Poor combustion conditions
2. High particulate entrained from the combustion process
3. Particulate hold-up in critical temperature window (150 - 450 °F)
4. Particulate matter which contains metal
5. Waste or fuel with complex organics and/or lignin like structure
6. Sufficient chlorine

Combustion turbines are very efficient combustors. Combustion turbines do not produce much if any particulate matter even when burning liquid fuels. The L.A. County source test data on two landfill gas combustion turbines did measure for TSP per EPA Method 5 and shows that most of the data is an order of magnitude below what is required by the most stringent South Coast AQMD applicable rule. Therefore the first four conditions which are related to high particulate matter formation do not occur because of the combustion turbine design. Landfill gas does contain some complex organics and chlorine but these factors are less important.

Proponents of the minority opinion have indicated that dioxin emissions have been measured from other combustion devices that burn landfill gas such as IC engines and flares and therefore it may be also formed when combustion turbines burn landfill gas. Comparing a turbine to a flare or IC engine is inappropriate for several reasons. Turbines are high speed (8,000 to 25,000 rpm), highly engineered turbomachinery employing state-of-the-art metallurgy, cooling systems, bearing systems, etc. Because the machines are high speed for higher efficiency, they are heavily instrumented to sense and shutdown runaway operation, overtemperatures, excessive vibrations, etc. The combustion system is a precise design of fuel and combustion air mixing and cooling air bypassing the combustor. Once the operating parameters are established by the turbine designer, they cannot be manipulated by the operator. True, an operator can choose to operate a turbine at extreme part load conditions, but since fuel economy is so poor at these conditions, we believe this is a natural deterrent to

operating at these levels for any length of time. (In the case of the southeast Wisconsin landfill cited in the minority position, the manufacturer was contacted who confirmed that the turbine could not sustain combustion at a "burning temperature" between 350-1000 F.) Combustion turbines are very different than flares and IC engines. Quenching effects that produce significant quantities of unburned complex organic compounds that are present in flares and IC engines do not occur in combustion turbines. These compounds increase the likelihood of dioxin formation. Furthermore, the dioxin data cited for flares shows the same levels of dioxin as required from municipal solid waste combustors with control of dioxin through carbon injection. Also, "particulate holdup" zones, a term used frequently with respect to emissions in the municipal waste combustor industry, really do not exist in most turbine installations.

The CTWG knows of two emissions tests on combustion turbines burning landfill gas. One is a German test which measured 4-5 picograms I-TEQ/m³ which is at or below ambient dioxin concentrations and which is much below the German level of concern 100 picograms I-TEQ/m³. The second test was performed in Wisconsin where 2,3,7,8-TCDD was not detected on a combustion turbine burning landfill gas. This data is consistent with our present understanding of dioxin formation and as expected is much lower than the measurements of dioxins from flares and IC engines.

Finally, there was some concern expressed by the CC that utility deregulation would bring an abundance of new combustion turbine installations at landfills in the future. Firstly, we believe this is a good thing as methane would be converted to CO₂ which has significantly less global warming potential while producing useful energy; secondly, the excellent destruction removal efficiency across combustion turbines of many other organics indicates to us good inherent control with this combustion device; and thirdly, future units that would be installed would be at landfills of the size that would fall under 40 CFR Part 60 Subparts WWW and Cc that requires a DRE of 98 percent across any control device.

The above information was factored into our consideration that turbines burning landfill gas are very unlikely to form dioxin in measurable quantities. Because of this the majority of the stakeholders do not believe that testing combustion turbines burning landfill gas is necessary.